

**Amendment to the Claims**

This listing of claims will replace all prior versions and listing of claims in the application:

**Listing of Claims:**

1. (currently amended) A method of relating a plurality of images of a tissue, said method comprising:

applying a chemical agent to a tissue, said chemical agent selected from the group consisting of acetic acid, formic acid, propionic acid, butyric acid, Lugol's iodine, Shiller's iodine, methylene blue, toluidine blue, and indigo carmine;

obtaining a plurality of images of said a-tissue;

determining a relationship between two or more regions in each of two or more of said images;

segmenting at least a subset of said two or more images based at least in part on said relationship; and

relating two or more images of said subset of images based at least in part on said segmenting.

2. (original) The method of claim 1, wherein said determining of said relationship comprises determining a measure of similarity between at least two of said two or more regions in each of said two or more of said images.

3. (original) The method of claim 2, wherein said determining of said measure of similarity comprises computing an N-dimensional dot product of mean signal intensities of two of said two or more regions.

4. (original) The method of claim 1, wherein said tissue comprises cervical tissue.

5. (original) The method of claim 1, wherein said plurality of images comprises sequential images of said tissue.

6. (original) The method of claim 1, further comprising filtering said subset of said two or more images.

7. (original) The method of claim 6, wherein said filtering comprises applying at least one of a temporal filter and a spatial filter.

8. – 9. (canceled)

10. (original) The method of claim 1, wherein said obtaining step comprises collecting an optical signal.

11. (original) The method of claim 10, wherein said optical signal comprises fluorescence illumination.

12. (original) The method of claim 10, wherein said optical signal comprises reflectance illumination.

13. (original) The method of claim 1, wherein said obtaining of said plurality of images comprises recording visual images of said tissue.

14. (original) The method of claim 1, wherein said relating step comprises determining a segmentation mask of an image plane wherein two or more regions of said image plane are differentiated.

15. (original) The method of claim 1, wherein said relating step comprises defining one or more data series representing a characteristic of one or more associated segmented regions of an image plane.

16. (currently amended) A method of relating a plurality of images of a tissue, said method comprising:

obtaining a plurality of images of a tissue, said tissue having had applied thereto a chemical agent selected from the group consisting of acetic acid, formic acid, propionic acid, butyric acid, Lugol's iodine, Shiller's iodine, methylene blue, toluidine blue, and indigo carmine;

determining a measure of similarity between two or more regions in each of two or more of said images; and

relating at least a subset of said two or more images based at least in part on said measure of similarity.

17. (original) The method of claim 16, wherein determining said measure of similarity comprises computing an N-dimensional dot product of mean signal intensities of two of said two or more regions.

18. (currently amended) A method of determining a tissue characteristic, said method comprising:

applying a chemical agent to a tissue, said chemical agent selected from the group consisting of acetic acid, formic acid, propionic acid, butyric acid, Lugol's iodine, Shiller's iodine, methylene blue, toluidine blue, and indigo carmine;

obtaining a plurality of images of said a-tissue;

determining a relationship between two or more regions in each of two or more of said images;

segmenting at least a subset of said two or more images based at least in part on said relationship; and

determining a characteristic of said tissue based at least in part on said segmenting.

19. – 20. (canceled)

21. (original) The method of claim 18, further comprising filtering said two or more images.

22. (original) The method of claim 21, wherein said filtering comprises applying at least one of a temporal filter and a spatial filter.

23. (original) The method of claim 18, further comprising processing said two or more images to compensate for a relative motion between said tissue and a detection device.

24. (original) The method of claim 18, wherein said tissue comprises cervical tissue.

25. (original) The method of claim 18, wherein said segmenting comprises analyzing an aceto-whitening signal.

26. (original) The method of claim 18, wherein said plurality of images comprises sequential images of said tissue.

27. (original) The method of claim 18, wherein said segmenting comprises analyzing a variance signal.

28. (original) The method of claim 18, wherein said segmenting comprises determining a gradient image.

29. (original) The method of claim 18, further comprising processing one or more optical signals based at least in part on said segmenting.

30. (original) The method of claim 18, further comprising filtering at least one image based at least in part on said segmenting.

31. (original) The method of claim 18, wherein said determining a characteristic of said tissue comprises determining one or more regions of said tissue with a suspicion of pathology.

32. (original) The method of claim 18, wherein said determining a characteristic of said tissue comprises classifying a region of tissue as one of the group consisting of normal squamous tissue, metaplasia, CIN I, and CIN II/CIN III.

33. (currently amended) A method of determining a characteristic of a tissue comprising the steps of:

(a) for each of a first plurality of reference sequences of images of tissue having a first known characteristic, quantifying one or more features of each of a plurality of mean signal intensity data series corresponding to segmented regions represented in said each of said first plurality of reference sequences of images, said tissue having had applied thereto a chemical agent selected from the group consisting of acetic acid, formic acid, propionic acid, butyric acid, Lugol's iodine, Shiller's iodine, methylene blue, toluidine blue, and indigo carmine;

(b) for a test sequence of images, quantifying one or more features of each of one or more mean signal intensity data series corresponding to one or more segmented regions represented in said test sequence of images; and

(c) determining a characteristic of a tissue represented in said test sequence of images based at least in part on a comparison between said one or more features quantified in step (a) and said one or more features quantified in step (b).

34. (original) The method of claim 33, wherein step (c) further comprises repeating step (a) for each of a second plurality of reference sequences of images of tissue having a second known characteristic.

35. (original) The method of claim 34, wherein step (c) further comprises applying a classification rule based at least in part on said first plurality of reference sequences and said second plurality of reference sequences.

36. (original) The method of claim 35, wherein step (c) comprises performing a linear discriminant analysis to determine said classification rule.

37. (original) The method of claim 33, wherein one of said one or more features quantified in step (a) comprises the slope of a curve at a given point fitted to one of said plurality of mean signal intensity data series.

38. (original) The method of claim 33, further comprising determining said segmented regions of said test sequence of images by analyzing an acetowhitening signal.

39. (original) The method of claim 34, wherein said first known characteristic is CIN II/CIN III and said second known characteristic is absence of CIN II/CIN III.